

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Abdurrahman Sezginer et al.

Application No.: 10/074,561

Filed: February 12, 2002

For: OVERLAY ALIGNMENT METROLOGY
USING DIFFRACTION GRATINGS

Group Art Unit: 2877

Examiner: Zandra V. Smith

**SUPPLEMENTAL INFORMATION
DISCLOSURE STATEMENT**121 Spear Street, Suite 290
San Francisco, CA 94105
(415) 512-1312Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450**CERTIFICATE OF MAILING**I hereby certify that this correspondence is being deposited
with the United States Postal Service as First Class Mail in an
envelope, addressed to: Commissioner for Patents, P.O.
Box 1450, Alexandria, VA 22313-1450 on March 3, 2004.
STALLMAN & POLLOCK LLPDated: 03/3 /2004By: Georgia K. Stith

Georgia K Stith

Sir:

Applicant(s) submit(s) herewith patents, publications or other information [attached hereto and listed on the attached Form PTO-1449 (modified)] of which they are aware, which they believe(s) may be material to the examination of this application and in respect of which there may be a duty to disclose in accordance with 37 CFR § 1.56.

This Information Disclosure Statement:

- (a) ☐ accompanies the new patent application submitted herewith. 37 CFR § 1.97(a).
- (b) ☐ is filed within three months after the filing date of the application or within three months after the date of entry of the national stage of a PCT application as set forth in 37 CFR § 1.491.
- (c) ☐ as far as is known to the undersigned, is filed before the mailing date of a first Office Action on the merits, or before a first office action after filing a Request for Continued Examination under §1.114.
- (d) ☒ is filed after the first office action and more than three months after the application's filing date or PCT national stage date of entry filing but, as far as is known to the undersigned, prior to the mailing date of either a final rejection or a

notice of allowance, whichever occurs first, and is accompanied by either the fee (\$180) set forth in 37 CFR § 1.17(p) or a certification as specified in 37 CFR § 1.97(e), as checked below.

- (e) ☐ is filed after the mailing date of either a final rejection or a notice of allowance, whichever occurred first, and the Issue Fee has not been paid, and is accompanied by the fee (\$130) set forth in 37 CFR § 1.17(i)(1) and a certification as specified in 37 CFR § 1.97(e), as checked below. This document is to be considered as a petition requesting consideration of the information disclosure statement.

[If either of boxes (d) or (e) is checked above, the following "certification" under 37 CFR § 1.97(e) may need to be completed.] The undersigned certifies that:

- (f) ☐ Each item of information contained in the information disclosure statement was cited in a communication mailed from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this information disclosure statement.
- (g) ☐ No item of information contained in this information disclosure statement was cited in a communication mailed from a foreign patent office in a counterpart foreign application or, to the knowledge of the undersigned after making reasonable inquiry, was known to any individual designated in 37 CFR § 1.56(c) more than three months prior to the filing of this information disclosure statement.

A list of the patent(s) or publication(s) is set forth on the attached Form PTO-1449 (Modified).

A copy of the items on PTO-1449 (Modified) is supplied herewith, except as noted below.

Those patent(s) or publication(s) which are marked with an asterisk (*) in the attached form PTO-1449 (Modified) are not supplied because they are (a) either U.S. Patents and this an application filed after June 30, 2003, or (b) were previously cited by or submitted to the Office in a prior application no. _____, filed _____ and relied upon in this application for an earlier filing date under 35 U.S.C. § 120.

A concise explanation of relevance of the items listed on form PTO-1449 (Modified) is:

- (k) ☒ not given
- (l) ☐ given for each listed item

- (m) ☐ given for only non-English language listed item(s) [Required]
- (n) ☐ is in the form of an English language copy of a Search Report from a foreign patent office, issued in a counterpart application, which refers to the relevant portions of the references [copy attached].

The Examiner is reminded that a "concise explanation of the relevance" of the submitted items "may be nothing more than identification of the particular figure or paragraph of the patent or publication which has some relation to the claimed invention," MPEP § 609.

While the information and references disclosed in this Information Disclosure Statement may be "material" pursuant to 37 CFR § 1.56, it is not intended to constitute an admission that any patent, publication or other information referred to therein is "prior art" for this invention unless specifically designated as such.

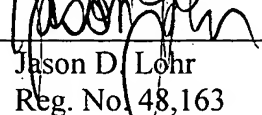
In accordance with 37 CFR § 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other material information as defined in 37 CFR § 1.56(a) exists. It is submitted that the Information Disclosure Statement is in compliance with 37 CFR § 1.98 and MPEP § 609 and the Examiner is respectfully requested to consider the listed references.

- ☒ The Commissioner is hereby authorized to charge our Deposit Account No. 50-1703, under Order No. TWI-30400, for any fees required in connection with the filing of this Information Disclosure Statement. **A duplicate copy of this Notice is enclosed for this purpose.** In particular, in the event that an Office Action has crossed in the mail with this Information Disclosure Statement, the Commissioner is authorized to charge the above-named deposit account for any fees required pursuant to CFR §§ 1.17(p) or 1.17(i)(1).

Respectfully submitted,

STALLMAN & POLLOCK LLP

Dated: March 2, 2004

By: 
Jason D. Lohr
Reg. No. 48,163

Attorneys for Applicant(s)

INFORMATION DISCLOSURE CITATION

(Use several sheets if necessary)

Docket Number (Optional)

TWI-30400

Application Number

10/074,561

Applicant(s)

Abdurrahman Sezginer et al.

Filing Date

February 12, 2002

Group Art Unit

2877

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	REF	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE
	AA	5,712,707	01/27/1998	Ausschnitt et al.	356	401	11/20/1995
	AB	5,795,687	08/18/1998	Yasuda	430	22	02/23/1996
	AC	5,805,290	09/08/1998	Ausschnitt et al.	356	401	05/02/1996
	AD	6,130,750	10/10/2000	Ausschnitt et al.	356	401	08/28/1997
	AE	6,458,605	10/01/2002	Stirton	438	7	06/28/2001
	AF	2003/0190793	10/09/2003	Brill et al.	438	401	09/20/2001

FOREIGN PATENT DOCUMENTS

	REF	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
	AG	62157295	06/23/1987	Japan	H01L	21/30	Abstract	
	AH	0 192 656 B1	05/23/1990	EPO	G01B	11/06		
	AI	WO 00/72093 A1	11/30/2000	PCT	G03F	9/00		
	AJ	WO 02/25723 A2	03/28/2002	PCT	H01L	21/66		

OTHER DOCUMENTS

(Including Author, Title, Date, Pertinent Pages, Etc.)

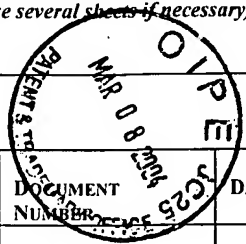
AK	C.C. Baum et al., "Scatterometry for Post-etch Polysilicon Gate Metrology", <i>Part of the SPIE Conference on Metrology, Inspection and Process Control for Microlithography XIII</i> , Santa Clara, CA, March 1999, SPIE Vol. 3677, pp. 148-158.
AL	J. Bischoff et al., "Single feature metrology by means of light scatter analysis", <i>SPIE</i> , Vol. 3050 (1997), pp. 574-585.
AM	J. Bischoff et al., "Diffraction analysis based characterization of very fine gratings", <i>SPIE</i> , Vol. 3099 (1997), pp. 212-222.
AN	J. Bischoff et al., "New aspects of optical scatterometry applied to microtechnology", <i>SPIE</i> , Vol. 3215 (1997), pp. 144-155.
AO	J. Bischoff et al., "Modeling of optical scatterometry with finite-number-of-periods gratings", <i>Part of the EUROPTO Conference on In-Line Characterization Techniques for Performance and Yield Enhancement in Microelectronic Manufacturing</i> , Edinburgh, Scotland, May 1999, SPIE Vol. 3743, pp. 41-48.
AP	J. Bischoff et al., "Characterization of 3D resist patterns by means of optical scatterometry", <i>Part of the EUROPTO Conference on In-Line Characterization Techniques for Performance and Yield Enhancement in Microelectronic Manufacturing</i> , Edinburgh, Scotland, May 1999, SPIE Vol. 3743, pp. 49-60.
AQ	J. Bischoff et al., "Light Diffraction Based Overlay Measurement", <i>Metrology, Inspection, and Process Control for Microlithography XV</i> , SPIE Vol. 4344 (2001), pp. 222-233.
AR	T. Bosworth et al., "Critical-dimension and overlay metrology: a review", <i>Solid State Technology</i> , September 1995, pp. 119-123.
AS	"Method for Measuring Semiconductor Lithographic Tool Focus and Exposure", <i>IBM Technical Disclosure Bulletin</i> , July 1987, pp. 516-518.
AT	"Interferometric Method of Checking the Overlay Accuracy in Photolithographic Exposure Processes", <i>IBM Technical Disclosure Bulletin</i> , Vol. 32, No. 10B, March 1990, pp. 214-217.

Examiner

Date Considered

Examiner: Initial if citation considered, whether or not citation is in conformance with MPEP Section 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

INFORMATION DISCLOSURE CITATION (Use several sheets if necessary)	Docket Number (Optional) TWI-30400	Application Number 10/074,561
	Applicant(s) Abdurrahman Sezginer et al.	
	Filing Date February 12, 2002	Group Art Unit 2877



U.S. PATENT DOCUMENTS

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FOREIGN PATENT DOCUMENTS

REF	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO

OTHER DOCUMENTS

(Including Author, Title, Date, Pertinent Pages, Etc.)

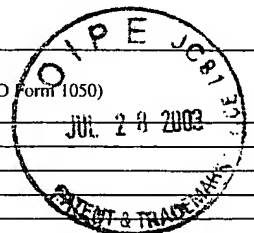
AU	"Phase-Sensitive Overlay Analysis Spectrometry", <i>IBM Technical Disclosure Bulletin</i> , Vol. 32, No. 10A, March 1990, pp. 170-174.
AV	"Interferometric Measurement System for Overlay Measurement in Lithographic Processes", <i>IBM Technical Disclosure Bulletin</i> , February 1994, pp. 535-536.
AW	"Interferometric Method of Checking the Overlay Accuracy in Photolitho Graphic Exposure Processes", <i>IBM Technical Disclosure Bulletin</i> , March 1990, pp. 214-217.
AX	P. Heimann, "The Color-Box alignment vernier: a sensitive lithographic alignment vernier read at low magnification", <i>Optical Engineering</i> , July 1990, Vol. 29, No. 7, pp. 828-836.
AY	"Layer Alignment/Overlay: Optical Diffraction", Nerac.com Retro Search, NERAC Inc., April 19, 2002, 93 pages in length.
AZ	"Lateral Shift: Optical Methods/Techniques", Nerac.com Retro Search, NERAC Inc., April 19, 2002, 90 pages in length.
BA	"Scatterometry and Overlay", Nerac.com Retro Search, NERAC Inc., April 19, 2002, 8 pages.
BB	N. Blayo et al., "Ultraviolet-visible ellipsometry for process control during the etching of submicrometer features", <i>J. Opt. Soc. Am. A</i> , Vol. 12, No. 3, March 1995, pp. 591-599.
BC	S. Sohail et al., "Optical Scatterometry for Process Metrology", <i>SPIE Vol. CR 72</i> (1999), pp. 129-143.

Examiner 	Date Considered
Examiner: Initial if citation considered, whether or not citation is in conformance with MPEP Section 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

Serial/Patent/Reg. No. 10/074,561 S&P File No. TWI-30400 By: MAS:gks
 In the Matter of the Application of: Abdurrahman Sezginer et al.
 Title/Mark OVERLAY ALIGNMENT METROLOGY USING DIFFRACTION GRATINGS
 Date Mailed: 7/25/2003 Due Date: 10/09/2003

The following has been received in the U.S. Patent and Trademark Office on the date stamped hereon:

<input type="checkbox"/> Transmittal Letter	<input type="checkbox"/> Trademark (Use) Appln., Drawing and _____ Specimens
<input type="checkbox"/> Patent Application _____	<input type="checkbox"/> ITU Trademark Application and Drawing
<input type="checkbox"/> _____ pgs. specification including _____ pgs. claims	<input type="checkbox"/> _____ Request for Extension to Time (trademark)
<input type="checkbox"/> Drawings _____ sheets _____ formal _____ informal	<input type="checkbox"/> (Notice of Allowance: _____)
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<input checked="" type="checkbox"/> Information Disclosure Statement, PTO-1449 w/ <u>14</u> references	<input type="checkbox"/> Certificate of Mailing
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